

Visualization of Radiation Environment on Mars: Assessment with MARIE Measurements

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For a given GCR (Galactic Cosmic Ray) environment at Mars, particle flux of protons, alpha particles, and heavy ions, are also needed on the surface of Mars for future human exploration missions. For the past twelve months, the MARIE (Martian Radiation Environment Experiment) instrument onboard the *2001 Mars Odyssey* has been providing the radiation measurements from the Martian orbit. These measurements are well correlated with the HZETRN (High Z and Energy Transport) and QMSFRG (Quantum Multiple-Scattering theory of nuclear Fragmentation) model calculations. These model calculations during these specific GCR environment conditions are now extended and transported through the CO₂ atmosphere onto the Martian surface. These calculated particle flux distributions are presented as a function of the Martian topography making use of the MOLA (Mars Orbiter Laser Altimeter) data from the MGS (Mars Global Surveyor). Also, particle flux calculations are presented with visualization in the human body from skin depth to the internal organs including the blood-forming organs.